

A DESCRIPTION OF A NEW SPECIES OF WASP ASSUMED TO  
BELONG TO THE FAMILY *VESPIDAE* AND NAMED  
*PARAVESPA EVA*; WITH REMARKS UPON ITS AFFINITIES  
WITH THE GENUS *ISCHNOGASTER* AND REASONS FOR  
THE CREATION OF THE NEW GENUS *PARAVESPA*.

BY

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(With a plate).

*PARAVESPA EVA*.

♀. Head, thorax, abdomen, including petiole, thinly pubescent, the pubescence longest on thorax and last three segments of abdomen and more or less golden on the last three segments, brown or silvery everywhere; head, pro- and meso-notum, scutellum, postscutellum and median segment very minutely punctured; clypeus very long, pointed, anteriorly carinated down the middle; median segment vertical, very obscurely rounded—carinate in anterior half along dorsal line, with a thin, also somewhat obscure furrow in continuation, in posterior half. Colour black with the middle third of petiole above and more extensively beneath ferruginous, the legs also having a ferruginous shade though otherwise black and the last three segments of abdomen being also light rusty; mandibles black, strongly three-toothed (see fig. 1 of plate), the ends of these teeth slightly ferruginous; antennæ black with stipes and last segment ferruginous; distal end of clypeus black, the rest as far as base of antennæ and the eye-sinus yellow; tegulæ dark brown; the following yellow markings; scutellum yellow except for a thin dorsal line and narrowish hinder margin (which are black); a thin band along front margin of postscutellum occupying about half the breadth of segment; a broad stripe on each side of median segment, a broad stripe on posterior margin of pronotum, a spot beneath each wing with a larger, lunulate one below that; the base of the second segment of abdomen broadly, the third segment similarly but more narrowly banded along front margin, this band interrupted in dorsal line and the fourth segment similar to third but the yellow hardly visible because of being telescoped into third; ventrally there is a small spot on each side of medial line near the middle of segment 2 and a large spot laterally near front margin of segment 3 that looks like a continuation of the band along its dorsal front margin; the yellow front of segment 2 is produced laterally backwards to make a spot symmetrical with this last; the tibiae of legs dorsally yellow. Wings hyaline with a very slight yellowish or brownish shade, the whole of the radial cell very dark, nearly black, suffused downwards to fill the outermost cubital cell.

♂. Exactly similar to the female except that there are seven abdominal segments instead of six (including the petiole) and the terminal joint of the antennæ is strongly suffused with black.

*Habitat*.—N. Kanara District, Bombay. ♂ ♀. *Length* 20 mm. and slightly over; especially up to 33 mm.

In Bingham's *Hymenoptera*, vol. i, p. 377 of the *Fauna of British India* series, this species would come in under division A as follows:—

A. Colours black with yellow or red markings.

a. Head and thorax black with yellow markings.

a'. Clypeus yellow with an irregular medial space black, not reaching its apex; median segment with a reversed T-shaped yellow mark on each side ... *micans*.

b'. Clypeus yellow without black medial space, median segment with a yellow spot on each side at apex. *fraterna*.

c'. Clypeus black with small central yellow spot; median segment immaculate black ... *scitula*.

d'. Clypeus yellow, except for a broadish black border reaching from apex to eye on each side, including apex; median segment with yellow, broad lateral stripe on each side ... *eva*.

b. Head and thorax black with red markings ... *rufomaculata*.

B. Colours rufescent brown or ferruginous with yellow markings.

a. Median segment very finely transversely striate ... *nigrifrons*.

b. Median segment smooth.

a'. Median segment with vertically impressed medial line; length 12 mm. ... *nitidipennis*.

b'. Median segment smooth throughout; length 18 mm. *eximia*.

As far as we are aware, *I. eva* is the only species of the genus that exists in India proper with the exception of Sikkim and its neighbourhood: *micans* reaching from Sikkim through Burma to Borneo; *scitula* from Sikkim to Assam; *fraterna*, *rufomaculata*, *nigrifrons* and *nitidipennis* are found in Tenasserim in Burma and *eximia* is confined to Ceylon. *Eva* so far is only known from the Kanara District in the Bombay Presidency where it apparently keeps to the forest-clad hills of the Western Ghats. It is there found from practically sea-level up to the tops of the hills which, however, do not reach to more than 2,600 ft. except for two small areas where a peak runs up to, at the most, 3,500 ft.

The wasp builds an absolutely unique pattern of mud nest very similar to that of *Ischnogaster eximia*, Bingham, first collected by E. E. Green in Ceylon and described by Colonel Bingham in the *Journal of the Bombay Natural History Society*, vol. v, p. 244, with an accompanying plate depicting, fig. 7, the nest. The description is repeated in Bingham's *Hymenoptera*, vol. i, p. 377, published seven years later in 1897. When I originally discovered my species in Kanara, I recognised it must be either the same as Bingham's or very closely related to it. His is 'dark rufo-ferruginous', mine is black and both have very similar yellow markings. His *eximia* has 'mandibles simple' and unidentate claws, both characters that make it abnormal for the family *Vespidæ*, but normal for its first genus *Ischnogaster* (itself abnormal for the family in possessing dentate claws). My species is abnormal for the family in the one character of the dentate claws and for the genus *Ischnogaster* in having the mandibles toothed as in the family. I met Colonel Bingham in 1908 in London and showed him my wasp and the plate accompanying this article (depicting fig. 1 the mandible, fig. 2 the nest and fig. 3 the imago) and, notwithstanding that I pointed out to him that my insect had *toothed* mandibles, he said it was *eximia*, ignoring this character and the difference in colour. It struck me from what he said that he thought he might possibly have made a mistake in describing the mandible of his species as 'simple'. Naturally I thought that Colonel Bingham must be right and from that day to this my specimens have lain in my collections unnoticed until this year (1935). For reasons given above I now know that my wasp is not *eximia* but differs from it in many characters other than colour and mandibles as may be seen by anybody taking the trouble to compare the two descriptions. I have just lately, within the last two months, December and January, collected some 13 or 14 specimens in the imago—and pupal state and three pupæ have produced imagines in the bungalow from nests collected outside—there are still some pupæ left to yield wasps. A Mantis, *Gongylus gongyloides*, kept in one of the cages with a nest, killed and demolished one imago without my being able to rescue it.

The nest is one of the most graceful bits of architecture conceivable, light as a feather and excessively fragile, built by the insect, small particle by particle of earth, brought on the wing and mixed with glutinous saliva to ensure adherence. It is invariably attached by the upper end to a dry and often nearly rotten rootlet hanging from the roof of a cavity in a bank in the jungles. When completed it hangs quite free and is never less than a couple of feet off the ground beneath. It resembles in shape an inverted pear with a lowly conical top and a cylindrical end that forms the entrance to the abode. The junction of sides with the roof is more or less angular but the other contours are gracefully rounded. The roof is low conical with the slope at an angle of about 45°, the bottom is a short tube made of little earth-pellets with interstices to resemble filigree work and the entrance at the bottom is ornamented, further, with an expansion, executed so as to resemble the distal half of a pointed leaf, extending well beyond the tube and as long as it is wide, embracing with its base the actual entrance-hole—a sort of platform for the insect to land upon when it arrives home. This

structure is further ornamented with a dozen low, rounded, longitudinal flutings extending the whole length and each alternate fluting has a lowly prominent ridge down its middle which is expanded outwards to a height of about 5 mm. into a thin triangular wing, deepest above in the horizontal plane of junction of sides with roof, about 10 mm. long, losing itself gradually in its ridge below; occasionally the wing on a particular ridge may be omitted and, as an expression of the exuberance of fancy animating a particular architect, there may be an extra wing, along one of the ridges continued onto the roof near the point of attachment. Inside this wonderful house are the cells, all built in a single series on the roof, all perfectly hexagonal, one against the other, 5 mm. in diameter by about 14 mm. in depth with very thin walls and well-smoothed interiors. All a truly wonderful piece of handiwork no parallel to which I have ever seen elsewhere. The nest resembles a delicate reproduction of a shell of the genus *Voluta* amongst the mussels. It also reminds one of a suspended bat when placed in a darkish corner and real bats are common enough in such places. The flutings on the outside correspond at their origin to the contours of the outer row of cells inside.

The largest nest I found was 80 mm. by 60 mm. over all, the entrance tube with its expansion taking up 20 mm. of the former while the prominence of the wings when existing is not included in the 60 mm. The diameter of the filigree tube is 10 mm., its length about the same. The smallest nest measured rather under 60 mm. by 40 mm. and contained only 14 cells. In the larger ones there are up to 21 cells and those forming the outer row appear always to be 12 in number which explains the number of the longitudinal flutings always present on the outside of the structure. The cells that have been inhabited can always be recognised by their mouths bearing remains of the covering (only a partial affair as a round aperture is always left in the centre) woven by the larva or grub when it 'spins' itself up before turning into the pupa. I have never found more than five of these used cells in any nest, new or old and, including all found, that means at least a couple of dozen examples. The wasps from one nest emerge at intervals of at least a week, often much longer. The building up of the entrance is presumably necessary to hold the pupa in place as, naturally, the cells being on the roof of the nest, these pupæ all lie with the head downwards. The head is held so that the face lies against the side of the nest, the abdomen is folded in against the sternum of the petiole and median segment and the cell opening is of much smaller diameter than the head and thorax.

Kanara is on the Western Ghats about 15° north of the equator and has, at Karwar, a yearly rainfall of 125 in. Inland, towards the crest of the Ghats, this may rise to 350 in. in certain places; in exceptional years it may even go to 450 in. and above and 150 in. on the sea-coast. The wet zone does not extend to more than at the outside 60 miles inland after which the rainfall rapidly diminishes eastward. At 60 miles inland it is, say, about 80 in., at 80 miles it is not over 25 in. The vegetation is Malayan in type in the wet parts, eastward it is all Deccan flora which means that the Ghats are largely covered with evergreen forests, the eastern country with deciduous species. The whole district is fully 85 per cent forest.

The insect under consideration is found only in the damper areas and the places where it first came to notice were cuttings in the sides of roads which were excavated to get the earth for annual repairs to their surfaces. Many of these are quite deep and shaped like the commencement of burrows and it was on the roofs of these that nests were originally discovered; the inhabiting wasps were at first only recognized as the architects of a beautiful mud nest. Later on specimens were collected and kept as adjuncts to the nest. That was forty years ago. There are many fine roads in Kanara running from the sea-board through the Ghats to the Deccan so that there was no lack of hunting ground in which nests could always be found; but, of course there are plenty of natural hollows in banks inside the jungles that are also used as building-sites. The particular requisites in the choice of a spot for the wasp seem to be a certain degree of humidity, absence of direct sunlight and a suitable 'roof' with rootlets hanging from it.

In no case has there been more than a single nest in any one cutting. In no case have there been more than three wasps in and around any nest and,

in the single case of three, one insect had certainly only just been born. In no case have any of the wasps caught 'wild' (which means at nests in the jungles) been other than female. In the last batch of insects obtained wild or bred in the bungalow from nests brought home there has not been one of the male sex.<sup>1</sup> I conclude from this that the male does not assist in the construction of the home, neither does he ordinarily help in domestic affairs any more than do the solitary wasps of the family *Eumenidae* immediately preceding these *Vespidæ*. These two species *eva* and (by general analogy, it is nearly certain) Bingham's *eximia* are, to all intents and purposes, 'solitary' wasps like the *Eumenidae* and, although more like *Vespidæ* in most respects, they constitute a link between the two families abnormal in possessing characters of more than generic value differentiating them from both. Bingham mentions this in the case of his *eximia* and, in another way, for the whole genus *Ischnogaster*. This genus is abnormal for the *Vespidæ* in that it possesses dentate claws (the family has simple ones).

I think the best way out of the difficulty would be, to obviate the necessity of making a new family for the exceptions, to divide the family *Vespidæ* into two sections:—

1. The perfectly normal insects.

2. The insects that are abnormal in one or more characters.

Under 2 would come the genus *Ischnogaster* and the two species *Eva* and *eximia* for which I suggest a new genus to be called *Paravespa*, as follows:—

Insects with unidentate claws, normal mandibles and of normal social habit	...	...	...	...	<i>Ischnogaster</i> .
Insects with unidentate claws, mandibles simple or normal (toothed) and of solitary habit	...	...	...	...	<i>Paravespa</i> .
Mandibles normal, claws abnormal for family	...	...	...	...	sp. <i>eva</i> .
Mandibles abnormal as well as claws	...	...	...	...	sp. <i>eximia</i> .

As a matter of fact these two wasps with their equivocal characters outlawing them from any existing family, should have had a family of their own, but one hesitates in introducing such a thing into the old and well established hierarchy of tribes, families and genera of the *Hymenoptera* we have been accustomed to recognise and work with for so long in the past.

The *Paravespa* wasp starts building operations at the commencement of the monsoon, in June in Kanara and goes on until about the end of January next with a lull in the months of February to next June necessitated, I have little doubt, by the lack of moisture in the air and paucity of prey and pabulum; probably chawed-up caterpillars. The new-born wasps, bred in captivity, spend a day or two after emergence in the nest and are very sluggish when they come into the open and, without food, only live for a day or two; when fed with sugar they live but a short day longer.

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<sup>1</sup> It was only after I had written the above that I bred two males from nests; the total number of wasps caught at nests and bred from them was 15; none of those caught at them were males.